European Journal of Special Education Research
ISSN: 2501 - 2428
ISSN-L: 2501 - 2428
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.1477124 Volume 3 | Issue 4 | 2018

A SYNTHESIS OF RESEARCH ON READING FLUENCY DEVELOMPENT: STUDY OF EIGHT META-ANALYSES

Susana Padeliadu,
Sophia Giazitzidou[i]
Aristotle University of Thessaloniki,
Greece

Abstract:
The goal of this paper was to identify the most effective instructional strategies for reading fluency development through a synthesis of eight relevant meta-analyses. In the first part, reading fluency instructional strategies are presented. In the second part, the major findings of the eight meta-analyses are recorded in chronological order. In the last part, meta-analyses findings are pooled together and discussed. The processing of the eight meta-analyses data follows and uses the "LD Alerts" format, concluding to "Promising" and "Carefully Used" instructional strategies. Through this synthesis, the role of repeated readings appears to be prominent in reading fluency instruction. In specific, repeated readings are more effective when they are used in combination with the strategies of self-monitoring, goal-setting and model reading. In addition, provision of preview and cue seems to have a decisive role in fluency instruction. Nevertheless, other strategies and intervention components appear to hold controversial or limited evidence.

Keywords: reading fluency, synthesis, teaching strategies, repeated readings

1. Introduction

Oral reading fluency is defined as the ability to read with speed, accuracy and prosody, automatically, with low level of attention on basic reading skills (NICHD, 2000; Schreiber, 1991; Therrien, 2004). According to National Reading Panel (2000), reading fluency, phonological awareness, phonics, reading comprehension and vocabulary constitute the five suggested fields for reading instruction and evaluation. The concept of reading fluency includes the coordination of multiple reading elements and procedures in order for every aspect of oral reading fluency to be supported (Breznitz, 2006). Consequently, automatization seems to be a prerequisite for reading fluency,

[i] Correspondence: email sgiazitzi@edlit.auth.gr

since it permits the visual and auditory processes to be conducted automatically and rapidly, releasing cognitive resources for reading comprehension (Katzir et al., 2006).

The role of reading fluency differs in orthographies with different level of orthographic consistency (Katzir, Schiff, & Kim, 2012). Specifically, the level of phonological regularity influences significantly the first stages of reading development (Wimmer & Schurz, 2010). Students in "shallow" orthographies have got an important advantage in succeeding in decoding processes, compared to their peers in "deep" orthographies, such as the English one (Seymour, Aro, & Erskine, 2003). Therefore, in these languages reading difficulties are manifested mostly in reading speed rather than in decoding (Wimmer, 1993).

The substantial number of reviews and meta-analyses that have been conducted on reading fluency and especially on effective instructional strategies reveals the strong research interest in this field (Chard, Vaughn, & Tyler, 2008· Galuschka, Ise, Krick, & Schulte-Korne, 2014; Kuhn & Stahl, 2003; Meyer & Felton, 1999; Morgan & Sideridis, 2006; Morgan, Sideridis, & Hua, 2012; NICHD, 2000; Suggate, 2014; Therrien, 2004). The strong interest in reading fluency is likely to be attributed to its strong relationship with reading comprehension (Breznitz, 2006; Kim, Park, & Wagner, 2014), since the two functions are highly correlated to each other throughout the school years (Hudson, Torgesen, Lane, & Turner, 2012; Kuhn & Stahl, 2003).

Reading fluency instruction does not constitute a separate and independent reading program, but it is included mostly as a component in reading comprehension programs (Hudson, Lane, & Pullen, 2005). In this context, National Reading Panel (2000) points out that "*despite its importance as a component of skilled reading, fluency is often neglected in the classroom*" (p. 189). At the same time, reading fluency appears to show the least progress, compared to other reading skills (Torgesen & Hudson, 2006). Consequently, systematic, direct and explicit instruction of reading fluency is considered imperative, since many students and mostly those with reading difficulties face problems in reading speed and prosody, despite their adequate decoding skills (McGuinness, 2004).

2. Reading Fluency Teaching Methods and Strategies

Over the last fifty years, various methods and strategies have been developed for reading fluency instruction. Repeated reading is the most commonly used method for reading fluency instruction, with several instructional strategies grounded on it (Hudson, Lane, & Pullen, 2005). These strategies are different from each other, depending on the level of support and guidance provided to reader during the reading program (Hudson et al., 2005). These strategies can be classified into several categories, based on specific criteria (Kuhn & Stahl, 2003; Pullen & Wills Lloyd, 2008). According to Rasinksi (2010), strategies for reading fluency instruction can be classified into three major categories: (a) the assisted reading strategies, (b) the repeated reading strategies, and (c) the performance reading. A disadvantage of this categorization is that many

instructional strategies can be classified into more than one category, causing overlapping and confusion. According to our opinion, more detailed categories could serve better for fitting each repeated reading strategy. In this paper, repeated reading strategies are classified into five categories, which are characterized by specific features. The categorization criteria are: (a) the different level of guidance, (b) the provision of cues before the beginning of the reading process, (c) the different level of previewing and (d) the performance reading. Based on the aforementioned criteria, almost every repeated reading strategy can be classified into one of the five following categories:

- Repeated reading without any feedback and support,
- Assisted repeated reading, including reading-while-listening,
- Repeated reading with cue provision, including goal-setting plus self-monitoring,
- Repeated reading with preview, and
- Performance reading.

A sixth category is emerged in order to fit the strategies that can be classified in more than one category, the overlapping strategies. In Table 1, the repeated reading strategies are presented, classified into the six proposed categories. In categories of assisted and performance reading, the repeated reading method is applied with the proposed instructional strategy simultaneously. In categories of cue and preview provision, the repeated reading method is applied at different times and order. Cues or previews are provided firstly, followed by the repeated readings of the text. Exception constitutes the self-monitoring strategy, which is applied at the end of every reading. In sixth category, strategies that can be classified into more than one category are included. These strategies can function at different levels each time, depending on the teaching goal. Specifically, pre-teaching of text key-words or difficult words can be classified either as an assisted reading strategy, since it promotes students' decoding skills or as a preview strategy. Similarly, model reading can be considered as an assisted reading strategy, which provides directly to the reader the prosodic cues of the text or as a preview strategy.

Table 1: The most frequent repeated reading strategies per category

Repeated Reading	**Assisted repeated reading**	**Repeated reading with cue provision**	**Repeated reading with preview**	**Performance reading**	**Over-lapping**
Repeated readings	Paired reading	Speed goal	Listening the text reading	Readers theater	Model reading
	Echo reading	Comprehension goal	Discussion about the subject of the text	"Say it like a character"	Pre-teaching of text key-words or difficult words
	Choral reading	Self-monitoring	Discussing about the text illustration	Radio reading	

	Neurological impress	Self-monitoring plus reinforcement	Discussion about the text title	Poetry performance	
	Reading while listening		Pre-teaching of text key-words or difficult words	Song lyrics performance	
	Model reading		Model reading		
	Pre-teaching of text key-words or difficult words				

2.1 Repeated Reading without any Feedback and Support

In 1979, based on the theory of automaticity, Samuels introduced the method of repeated readings. According to the repeated reading method, the student reads a text or a part of it either for a predetermined length of time or for as many times as to "reach" a predetermined performance criterion on reading speed and accuracy (Samuels, 1979). The first citation of the repeated reading method is dated back in 1908 by Huey in his book "The Psychology and Pedagogy of Reading". According to Huey (1908), reading repetition releases conscious attention gradually from the details, facilitates general reading skill and decreases reading time. The implementation of the repeated reading method has been found to cultivate and develop every aspect of reading fluency: decoding accuracy, reading speed and prosody and on a lower, nevertheless remarkable level, reading comprehension (Dowhower, 1989). Furthermore, the method of repeated readings has reported to have a positive impact both on students with and without reading difficulties and mostly on students who are into the transitional level of their reading development (Meyer & Felton, 1999).

2.2 Assisted Repeated Reading

The provision of guidance, supervision and feedback during the reading process constitutes the basic teaching principle in assisted repeated reading strategies. Students read a text either one after the other or in paired groups or even in small groups under the guidance of a teacher or of an experienced peer reader. The person supporting the poor reader undertakes the role of providing guidance and feedback both for reading accuracy and expression. Feedback can be provided either immediately, when the student makes the mistake or at the end of the reading process. Relevant studies investigating the effectiveness of assisted repeated reading strategies have documented a positive effect on every aspect of reading fluency (Schreiber, 1991). Assisted repeated reading strategies may take several forms, such as the paired reading, the echo or the choral reading and the neurological impress reading. The reading-while-listening strategy is also included in this category. In this strategy, readers have the choice either to listen to the text model reading during their reading or listen to the text model reading by a teacher, by an experienced peer reader or even by a recorded material before the beginning of the reading process (Rasinski, 2010). The strategy of reading-

while-listening provides direct access to the text model reading and its prosodic cues, enhancing significantly reading expression (Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; NICHD, 2000; Yang, 2006).

2.3 Repeated Readings with Cue Provision

Any type of goal-setting before the beginning of the reading process is considered as a cue. Based on this assumption, reading with cue provision can be applied in several ways, depending on the teaching goal. One major cue is the determination of a specific reading purpose, i.e. asking the students to read the text as fast as they can or to read the text in order to comprehend it or both of them. Goal-setting with self-monitoring can be considered as a cue provision strategy, as well. In the self-monitoring condition, the reader in collaboration with the teacher sets a specific reading performance goal, regarding the number of words and in the time that text have to be read. After each reading repetition, reading accuracy and speed are recorded on a graph by the student. The fact that students record their reading performance on a graph provides them with continuous evaluation of their reading progress, cultivating not only their self-regulation, but also their self-management skills, contributing eventually to their reading fluency development (Morgan & Sideridis, 2006). In some interventions, implementation of the self-monitoring strategy is combined with reinforcement, which means that when students achieve or overcome the predetermined reading goals, a symbolic gift is provided to them as an award (Morgan et al., 2012).

2.4 Repeated Readings with Preview

Repeated reading with preview includes several strategies, which improve reading fluency and comprehension to a large extent (Faulkner & Levy, 1999). The goals of previewing is: (a) deep comprehension of the text content, (b) construction of semantic expectations about it, (c) active students' involvement, (d) retention of linguistic information, and (e) activation of students' prior knowledge (Chard et al., 2002). Text previewing can be achieved by discussing about the text content or illustration, by listening to the text model reading or even by sight-word reading strategies. Pre-teaching of text key-words or difficult words separately, before reading them in the text, constitute a common sight-word reading strategy, which can be considered as a preview. Firstly, the teacher asks the student to read the text independently, without providing any kind of support. During the student's reading, the teacher records the misreadings. After that, the teacher asks the student to read aloud these particular words separately (Morgan & Sideridis, 2006). The instructional strategies often used in developing sight-word reading are: (a) flash-cards, (b) word lists, and (c) specially designed presentations in Power Point (Padeliadu & Botsas, 2007).

2.5 Performance Reading

Performance reading sets reading instruction in a real context by incorporating a realistic reading goal and activating readers' involvement and motivation (Rasinksi,

2010). The reader theater, the radio reading, the poetry performance and the song lyrics performance are some strategies of performance reading. During their implementation, the reader is asked to give a performance by reading a script or a scene, undertaking the role of an actor or of a professional radio speaker. Successful application of the performance reading strategies requires both repeated readings in order for students to be prepared to give their reading performance and also text comprehension in order to read the text expressively (Rasinski, 2010).

3. Purpose of the Study

There is strong research data supporting the effectiveness of the repeated reading method in reading fluency development (NICHD, 2000). However, the studies that used some type of repeated reading method were very diverse, in terms of measured variables and implementation characteristics, making conclusion about the effectiveness that each of them has very difficult. Firstly, these studies were conducted with different groups. Some of them were conducted with typical readers, while others with students with reading difficulties. Moreover, group ages ranged from lower elementary grades to upper secondary grades. In addition, interventions were applied in different class contexts and with different experimental designs. Some of them were conducted in special educational settings, while others in general classrooms. Some of them had a single-subject design, while others had control groups and between-subject designs. Finally, each reading fluency intervention used a unique combination of repeated reading strategies, without being clear which strategy of them was most effective in reading fluency development and most appropriate for each student group.

In this paper, we intended to identify the most effective strategies and intervention components for reading fluency instruction through the study of eight relevant meta-analyses available in the literature. Specifically, we borrowed and used the format of the "Teaching Learning Disabilities Alerts" published by the "Council for Exceptional Children". Based on the "LD Alerts" frame, we evaluated the data of eight meta-analyses in order to identify: (a) the "Promising" strategies and intervention components that are based on well-established evidence and they should be used in reading fluency instruction and (b) the "Carefully Used" strategies and intervention components that rely on controversial or limited evidence and they should be used with caution.

4. Record of Eight Meta-analyses

For this meta-analyses review, a comprehensive search of literature was conducted by the second author. The search for the relevant meta-analyses covered ERIC, PsycINFO, ProQuest and Google Scholar research bases, using the following key-words: *review, meta-analysis, summary, synthesis, reading fluency, repeated readings, reading rate, reading speed, oral reading, reading difficulties, dyslexia, learning disabilities, struggle readers, reading*

disabilities, at-risk readers. In addition to the computer searches, a search in data base of several major journals was conducted, separately. The journals that were searched were: *Annals of Dyslexia, Education and Treatment of Children, Journal of Applied Behavior Analysis, Journal of Behavioral Education, Journal of Educational Psychology, Journal of Experimental Psychology, Journal of Learning Disabilities, Journal of Reading Behavior, Journal of Special Education, Learning Disabilities Research, Learning Disability Quarterly, Plos, Intervention in School and Clinic, Reading Research Quarterly, Remedial and Special Education, Remedial and Special Education* and *School Psychology Review.*

The literature search resulted in eight meta-analyses (Galuschka et al., 2014; Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012; NICHD, 2000; Suggate, 2014; Therrien, 2004; Yang, 2006). Six out of eight meta-analyses were published in peer-reviewed journals from 2004 to 2015 (Galuschka et al., 2014; Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012; Suggate, 2014; Therrien, 2004). One meta-analysis was conducted in the context of a doctoral dissertation, published in 2006 (Yang, 2006) and one was conducted on behalf of the National Institute of Child Health and Human Development in 2000.The studies included in the eight meta-analyses were published from 1966 to 2013 and they were characterized by heterogeneity regarding their methodology, experimental design, research questions, participants' age and cognitive characteristics, type and duration of the intervention programs, instructional strategies, criteria used for including a research in their meta-analysis and definition criteria for reading difficulties and disabilities.

The meta-analyses review revealed that research interest focused mostly on strategies and intervention components that make reading fluency instruction more effective. Furthermore, interest focused mostly on the reading fluency instruction for students with reading difficulties. Specifically, five out of eight meta-analyses posed research questions such as: (a) which are the specific intervention features that have high effect sizes on reading fluency instruction and (b) which are the specific intervention features that are appropriate for reading fluency instruction for students with reading difficulties. Also, two out of eight meta-analyses set research questions such as: (a) what is the effect of the repeated readings on reading fluency, (b) what is the effect of the repeated readings on reading fluency in students with reading difficulties, (c) what is the long-term effect of reading fluency interventions, and (d) which is the influence of gender, grade, type of schooling and participants' cognitive characteristic on reading fluency instruction.

The eight meta-analyses are organized and reviewed chronologically (Table 2). In the context of each meta-analysis, we present the research goal and questions, the number of studies included in each of them, the research methodology, the participants' characteristics and grades as well as its findings.

Table 2: The eight reading fluency meta-analyses

Authors	Title	Year of publication	Number of examined studies	Reference group
National Institute of Child Health and Human Development	Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769)	2000	14	K-12th Grade students with and without reading problems
Therrien, W.	Fluency and comprehension gains as result of repeated reading: A meta-analysis.	2004	18	5-12 years students with and without learning disabilities
Morgan, P., & Sideridis, G.	Contrasting the effectiveness of fluency interventions for students with or at risk for learning disabilities: A multilevel random coefficient modeling meta-analysis	2006	30	K-12th Grade students with or at risk for learning disabilities
Yang, J.	A meta-analysis of the effects of interventions to increase reading fluency among elementary school students	2006	39	K-6th Grade students with and without disabilities
Morgan, P., Sideridis, G., & Hua, Y.	Initial and over-time effects of fluency interventions for students with or at risk for disabilities	2012	44	K-12th Grade students with and without disabilities
Galuschka, K., Ise, E., Krick, K., & Schulte-Körne, G.	Effectiveness of treatment approaches for children and adolescents with reading disabilities: A meta-analysis of randomized controlled trials	2014	5 reading fluency studies out of 22 reading studies	Children and adolescents students with reading difficulties
Suggate, S.	A meta-analysis of the long-term effects of phonemic awareness, phonics, fluency, and reading comprehension interventions	2014	12 reading fluency studies out of 71 reading studies	Pre- 6,5 Grade students with and without learning disabilities
Lee, J., & Yoon Yoon, S.	The effects of repeated reading on reading fluency for students with reading disabilities: A meta-analysis	2015	34	K-12th Grade students with reading difficulties

The National Reading Panel (2000) conducted a study in order to identify the most effective instructional methods for reading fluency instruction. The initial goal was to compare the effectiveness of two widely used instructional methods: the method of oral repeated readings or guided repeated readings with the method of independent or

silent reading. However, due to the methodological difficulties only the data of the repeated reading studies was examined. In the final analysis, the results of 14 studies were used to address the Panel's question. The studies were published from 1970 to 1999 and they were heterogeneous in terms of duration, participants' characteristics and grades, research methodology and experimental design. The studies included both students with and without reading problems from kindergarten through 12th grade. In meta-analysis both single-subject and between-subject design studies were examined. Overall, the results showed that repeated readings had a consistent and positive effect on word recognition, reading fluency and comprehension, as measured by a variety of test instruments. The effect size on word recognition corresponded to 0.55, on reading fluency to 0.44 and on reading comprehension to 0.35, respectively. Furthermore, repeated readings had clear effect on reading ability of non-impaired readers through at least grade four as well as on students with reading problems throughout high school. Also, repeated readings in combination with feedback and guidance provision resulted in greater improvement in reading in students with and without reading difficulties. Finally, it was found that the repeated reading method was effective under a wide variety of conditions and with minimal special training.

Therrien (2004) published another meta-analysis, analyzing data from 18 repeated reading intervention studies. The goal was to examine the level of effectiveness that: (a) the repeated reading method has in reading fluency development, (b) the additional components within repeated reading interventions have in reading fluency development, and (c) the repeated reading method has in reading fluency development in students with learning disabilities, separately. The examined studies, published from 1985 to 2000, were experimental and used school-age participants (5-12 years old) with and without learning disabilities. The effect sizes were calculated separately for familiar and unfamiliar texts. Specifically, a total number of 28 nontransfer effect sizes were calculated. Across all nontransfer measures, the mean fluency effect size was .83. Particularly, for familiar texts students that cued to focus on speed, on comprehension and on both speed and comprehension recorded a fluency effect size of .72, .81 and .94, respectively. Regarding corrective feedback provision, students who received corrective feedback reported a mean fluency effect size of .68, compared to those who didn't receive it, who reported .88. Regarding performance criteria, interventions that used performance criteria obtained a mean effect size of .81, compared to those that used fixed number of repetition, which reported different effect sizes (two times ES=.57, three times ES=.85 and four times ES=.95).

Regarding the results referred to unfamiliar texts, which examined the level of generalization of obtained reading fluency to new, unfamiliar texts are presented below. Generally, the mean effect size of reading fluency to new unfamiliar texts was moderate (d=.50). Interventions that conducted by an adult obtained an effect size of 1.37, compared to .36 of studies that conducted with peers' involvement. Interventions that included model reading documented an effect size of .40, compared to those which didn't include it which had .30. Students who received corrective feedback recorded an

effect size of .51, while those who didn't receive it .46. It is impressive that the interventions, which provided corrective feedback only by adults, obtained a mean effect size of 1.37. Furthermore, interventions that used a performance criterion obtained a mean effect size of 1.70, compared to those that didn't use it, which documented a mean effect size of .38. Interventions included a charting card reported a mean effect size of .57, compared to those that didn't use it, which had .40. Respectively, adult-implemented interventions with charting students' progress reported a mean effect size of 1.58. Finally, for familiar texts the effect size for students with learning disabilities was .75 and for students without .85. Conversely, for unfamiliar texts, the effect size for students with learning disabilities was .79 and for students without .59. Overall, this meta-analysis indicated that the repeated reading method could be used effectively with students with and without learning disabilities to cultivate reading fluency both at particular passages and at new ones, developing their general reading fluency ability. However, the level of reading fluency development varies as a function of the different additional instructional components within repeated reading method (Therrien, 2004).

Morgan and Sideridis (2006) conducted a meta-analysis of 30 single-subject design studies. The goal was to compare the effectiveness of the different types of fluency interventions in students with or at risk for learning disabilities. Specifically, the research questions concerned: (a) the type of intervention that leads to the greatest gains in oral reading fluency, (b) the mediating role of gender, grade and student's school placement in intervention effectiveness, and (c) the long-term effects that some interventions may have on students' fluency. Participants were attending kindergarten through 12th grades either in general or in special educational settings. The studies, published from 1977 to 2004 in refereed journals, reported results of 107 participants, provided data for 144 experimental phases. The single-subject design studies had at least two phases and included measurement over at least three time points. Using chi-square difference tests, the researchers found that the most-to-least effective interventions after controlling for baseline levels of fluency, gender and placement were: a) the goal-setting with mean improvement of 94 correct words per minute (cwpm), b) the goal-setting and reinforcement (M=89 cwpm), c) the reinforcement (M= 85 cwpm), d) the repeated readings with model reading and tutoring (M=79 cwpm), e) the keywords pre-teaching and preview (M=71 cwpm) and f) the word recognition training (M=49 cwpm). It should be mentioned that the goal setting and reinforcement strategies involved repeated readings. The tests showed that these differences in gains between the interventions were statistically significant. Overall, this meta-analysis indicated that the most effective interventions were the repeated readings with reinforcement, documenting high effect size on reading fluency of students with or at risk for learning disabilities. The repeated readings with or without model reading, the previewing of text content or text keywords and the guided or assisted reading reported moderate to up to moderate effect size on students' reading fluency. The interventions that contained sightword reading teaching strategies recorded low effect

size. Moreover, it seemed that placement (general or special educational setting) affected the interventions effectiveness. Students who were enrolled in general educational settings indicated higher improvement in their reading fluency, reading on average 12.7 cwpm more than students in special educational settings. One possible interpretation of this result is that students who were enrolled in special schools and settings were identified by severe reading difficulties, leading to lower level of responsiveness to interventions, compared to students who were attending general schools. Finally, regarding the lasting effects of interventions, goal-setting led to significant growth over time, compared to the most commonly studied fluency interventions, such as the repeated readings with model reading, which recorded treatment effects below the goal-setting interventions (Morgan & Sideridis, 2006).

Yang (2006) in his dissertation conducted a meta-analysis of 39 experimental studies in order to evaluate the effect sizes of repeated reading interventions on reading fluency for students with and without disabilities and identify the factors that are associated with or best predict the least or most effective interventions. Specifically, the studies, published from 1966 to 2001, involved elementary-aged students (K-6th grade) with and without disabilities. Only studies of between-subject designs, using control groups were included in the meta-analysis. The examined studies were heterogeneous in terms of school context (general/special educational settings), subjects, training materials and intervention duration. According to results, the mean effect size of reading speed was positive, ranging from small to moderate (M=.30). Regarding the mean effect sizes by students' group, interventions involving remedial readers produced largest effect (.37) than those which involved readers with disabilities (.34) or normal readers (.18). Furthermore, the mean effect size according to treatment type ranged from small to medium. Specifically, the effect sizes of repeated readings or guided oral reading of continuous texts and mixed texts and separate words corresponded to .36 and .32, respectively. Interventions that included independed reading or training at word level reported small effect sizes (ES= -.03 and ES= 0.21, respectively). Interventions that contained repetitive practice produced moderate mean effect size (.30), while those that didn't use it reported the half effect size (.15) (Yang, 2006).

Regarding the type of reading material, interventions that used repetitive practice of continuous texts recorded a mean effect size of .35, while those that used repetitive practice of separate words reported smaller effect size. Data analysis indicated that intervention duration plays important role in its effectiveness, as well. Interventions that lasted from one to six weeks had effect size equivalent to .50, while those that lasted longer had smaller effect on reading speed (7-20 weeks ES=.40, 21-36 weeks ES=.16). Furthermore, the more frequent the sessions were, the smaller the effects were. Specifically, interventions that contained one to two sessions per week had a mean effect size of .38, interventions that included three to four sessions per week had an effect size of .29 and those that had daily sessions .24, respectively. Moreover, effect sizes were different according to session length. Interventions that contained sessions

lasting 15 to 30 minutes had an effect size equal to .33, sessions lasting 31 to 45 minutes equal to .24 and up to 45 minutes equal to .44. Contrary to the aforementioned data, the most effective interventions for reading fluency development hierarchically were those that lasted maximum 60 minutes per week (.40), those that lasted up to 120 minutes per week (.31) and those that lasted 61 to 120 minutes per week (.26). Regarding the total time of interventions, the most effective were interventions that lasted 15 to 30 hours (.49). Interventions that lasted fewer hours had smaller effect sizes (1-15 hours ES=.34, 30-40 hours ES=.19, >40 hours ES=.24). In addition, data analysis indicated that teacher-directed instruction produced the smallest effect (.24), compared to .29 of peer tutoring interventions and .46 of independent working. Finally, interventions which cued to focus on speed, on comprehension and on both speed and comprehension recorded a fluency effect size of .26, .12 and .35, respectively. Generally, Yang (2006) showed that reading fluency interventions are moderately effective. His meta-analysis results reveal that the best intervention for reading fluency development is the one which included reading comprehension training. Finally, he confirmed that repeated reading method and other guided oral reading strategies, compared to general teaching strategies, such as the direct instruction or effective teaching, are more effective in helping students develop reading fluency.

In a later study, Morgan, Sideridis and Hua (2012) evaluated data from 44 single-subject design studies, published in peer-reviewed journals from 1977 to 2005, in order to: (a) identify the interventions that immediately increase the oral reading fluency, (b) estimate to what extent these gains maintain over time, and (c) evaluate whether particular characteristics of students (gender, disability status, grade, school placement) predict their response to fluency interventions. In this meta-analysis, experimental studies with at least two phases and measurements over at least three time points were included. The final poll of 44 studies involved 290 school-aged children (K-12th grade). 234 students were being educated in general educational classrooms and 56 were receiving special educational services in segregated settings. Researchers used a multilevel modeling in order to meta-analyze the results of the 44 studies.

According to results, the most effective intervention at the intercept level was the goal-setting, followed by the reinforcement, the preview and repeated readings, the tutoring and the word level and phonological training. The goal setting resulted in a statistical significant mean effect of 64.29 cwpm, after accounting for student's baseline levels of fluency, as well as additional factors, such as the gender, the grade, the race and the placement. The least effective intervention was the word-level and phonological training, which resulted in a statistically non-significant gain of 9.85 cwpm. Chi-square difference tests indicated that, for between-intervention differences, the goal setting was significantly more effective compared to other interventions. Regarding the linear effects, the goal-setting was the intervention, which was associated with the most significant growth, followed by the preview repeated readings and by the word-level and phonological interventions. Neither reinforcement nor tutoring was associated with significant linear growth. Moreover, the analysis displayed that there were three

significant quadratic effects. The two negative quadratic paths showed that previewing and repeated readings and the word-level and phonological training became gradually less effective over time, while the positive quadratic effect recorded by the goal-setting, which became more effective over time. Overall, the data analysis indicated that the most effective strategies for reading fluency development were those that triggered student's motivation, active involvement and willingness. Interesting were the results about the mediating role of gender, grade, disability status and placement in intervention effectiveness. Students of minority racial/ethnic heritage responded well to systematic fluency intervention (16.43, p=.002), as older students did (1.70, p=.008). Students with visual impairments and learning disabilities made the greatest gains over their baseline levels of fluency (65.87 p=.001 and 44.92, p=.000, respectively). Students with autism, mental retardation and behavioral disorders indicated lower development (for autism 16.60, p=.019, for mental retardation 29.13, p=.002 and for students with behavioral problems 21.14, p=.009) (Morgan et al., 2012).

Galuschka, Ise, Krick and Schulte-Körne (2014) evaluated the results of 22 experimental studies in order to examine the effectiveness of different interventions in performance of students with reading difficulties. The goal was twofold: (a) to determine the effectiveness of the different interventions in reading and spelling performance of children and adolescents with reading difficulties and (b) to explore the mediating role of various factors in the efficacy of these interventions. The studies involved between-subject design, using control or placebo groups and they were published between 1985 and 2013. Participants were children and adolescents whose reading performance was below the 25th percentile or below at least one standard deviation. Meta-analysis was computed with a total of 49 comparisons between experimental and control groups. 5 out of the 49 comparisons concerned reading fluency interventions, including repeated word and text reading or guided repeated reading. The reading fluency studies aimed at improving word recognition skills. The meta-analysis results were calculated separately for reading and spelling performance. In this paper, only the data about the reading performance is reviewed.

According to meta-analysis results, phonics instruction was the only teaching approach, which had significant effect on reading performance. In addition, analysis revealed that interventions conducted with students with mild reading problems reported a slighter higher mean effect size (g'=0.449), compared to those that conducted with students with moderate (g'=0.228) or severe reading problems (g'=0.305). However, the differences were not statistically significant (p=.188). No significant differences (p=.250) were found between the mean effect sizes of interventions that lasted up to 14 hours (g'=0.351), interventions that lasted 15 to 34 hours (g'=0.113) and interventions that lasted more than 35 hours (g'=0.371). Similarly to previous results, no significant differences (p=.432) were found between studies with maximum duration of 12 weeks (g'=0.261) and studies that lasted more than 12 weeks (g'=0.353). Interventions conducted by researchers documented high effect size (g'=0.806) compared to studies which were conducted by teachers (g'=0.247), therapists (g'=0.256) and students

(g'=0.400). Although no significant differences between those subgroups were identified (p=0.88). Overall, the results of this meta-analysis demonstrated that reading fluency interventions alone is not efficient and adequate to improve reading skills of students with reading difficulties. Although phonemic awareness instruction in combination with reading fluency training result in better results, increasing the reading performance of children and adolescents with reading difficulties (Galuschka et al., 2014)

In a recent meta-analysis, Suggate (2014) studied the data of 71 reading intervention studies in order to examine the retention of the effect sizes over time. To rectify this, an analysis of the follow-up effects as a function of intervention, sample and methodological variables was conducted. In the meta-analysis context, the results of experimental and quasi-experimental reading interventions, focused on phonemic awareness, phonics, fluency and comprehension were examined. The evaluated studies, published in peer-reviewed journals between 1980 and 2013, included a follow-up assessment and contained at-least one control or comparison group. The mean time from the post-tests to the follow-up tests was 11.17 months. The grades of the samples ranged between pre-school students and 6.5th grade. Especially for reading fluency, 12 interventions contained repeated readings or peer tutoring strategies focusing only on reading connected texts were examined. It should be mentioned that some fluency interventions contained components of phonics instruction, as well.

According to data analysis, normal readers appeared to lose their advantage over control groups in follow-up tests with interventions administered by researchers resulting in larger effect size at posttests over the other type of intervention administrators. Specifically, the mean effect size at posttests for typical readers was .28 and for reading disabled .37, while at follow-up tests was .13 and .30, respectively. Furthermore, at posttests the effect size of interventions administered by researcher (ES=.60) or by trained intervener (ES=.49) were high to moderate, losing however their effect at follow-up tests (ES=.36, ES=.34, respectively). Interventions administered by teachers and with computer or peer involvement indicated moderate to small effect sizes at posttests (ES=.41, ES=.31, ES=.37), losing however the magnitude of their effect at follow-up tests (ES=.10, ES=.25, ES=.30, respectively). Furthermore, it was particularly evident that the younger the intervention sample was the lower the effect size at follow-up tests was. Specifically, for kindergarten and pre-school students the effect sizes reduced from .34 to .12 at follow-up tests and for students in grade 1 to 2 from .40 to .26, respectively. Contrary to the above results, the effect sizes for older students (grade 3 to 6) increased from .35 to .43 at follow-up tests. Regarding the intervention goal, analysis indicated that the most effective interventions were the phonemic awareness and reading comprehension interventions and the mixed programs. Reading fluency and phonics interventions reported lower results. In particular, their effect sizes were moderate to small, reducing their rates from .47 to .28 and from .29 to .07 at follow-up tests, respectively. Therefore, 11 months after participating in interventions with

phonemic awareness, phonics, reading fluency or comprehension approaches a small effect of the interventions remains (Suggate, 2014).

Finally, Lee and Yoon Yoon (2015) conducted a meta-analysis of 34 empirical studies in order to identify the effects of repeated reading interventions on reading fluency of students with reading difficulties. The goal was to examine the overall effects of repeated reading method itself and the effects of the additional instructional components within repeated reading interventions on reading fluency performance. The examined studies were peer-reviewed articles and dissertations, published from 1992 to 2012, had experimental design and were conducted only with students with or at risk for learning disabilities in kindergarten to 12th grade. The final poll was comprised of 34 studies, examining in total 39 independent effect sizes. The estimated overall Hedges' g of the 39 independent effect sizes revealed the positive effect of repeated readings on reading fluency of students with reading difficulties, especially at the elementary grade level. The findings also suggested that a combination of the repeated reading method and listening passage preview would be the most effective method for these students. Specifically, the effect size seemed to be larger in younger students, supporting that the grade and the level of reading skills play a major role in the degree of success and intervention effectiveness. Subgroup analyses of studies reported that the repeated reading interventions were more effective in elementary students (g'=1.63) than in secondary ones (g'=0.86), as well as in students at elementary reading level (g'=1.25) than at secondary reading level (g'=0.86), with the differences being statistically significant for both of them (p=.005 and p=.001, respectively). Regarding the additional intervention components, the repeated reading method in combination with the listening passage preview had higher effect size (g'=1.95) on reading fluency than the repeated reading method without listening passage preview (g'=0.94). The difference was statistically significant (p=.003). However, no significant differences were found between the conditions of repeated reading with word preview (g'=1.52) and immediate feedback provision (g'=1.20) and the repeated reading interventions without them (g'=1.12 and g'=1.22, respectively). Furthermore, the analysis revealed that the effect of the goal setting implementation (g'=1.19) was not statistically significant from the repeated reading without it (g'=1.21). Similarly, there was no difference between with and without reinforcement provision, even though studies with reward showed a larger weighted mean effect size (g'=1.65) than studies without the reward provision (g'=1.09). In addition, the meta-analysis showed that difference between the repeated reading interventions with (g'=1.10) and without (g'=1.29) peer-mediated reading was not significant (p=.416) (Lee & Yoon Yoon, 2015).

Statistical analysis about the number of reading repetition indicated that when the maximum number of repeats during the intervention was subgrouped by two, three and four and more repeats, the difference among the three groups was significant (p=.002). in addition, when the maximum number of repeats was four and more, the effect of repeated reading interventions (g'=1.73) was significantly different from two and three repeats (g'=1.45 and g'=0.82, respectively). Finally, results indicated that the

effect of generalized transfer passages (g'=0.97) was smaller than the effect on nontrnasfer practiced passages (g'=1.94), with the difference being significant (p=.001). Generally, this study demonstrated that text model reading with at least four reading repetitions is the most effective teaching method for improving and cultivating reading fluency in students with reading problems. Contrary to other studies, the larger effect size of the feedback, self-monitoring, goal-setting and assisted reading strategies over the interventions that didn't include them is not confirmed (Lee & Yoon Yoon, 2015).

Overall, results of the eight meta-analyses indicated that the majority of the reading fluency intervention studies focus mostly on young students and on students with reading difficulties, searching the most effective reading fluency instructional strategies and components. In this context, the effectiveness of the repeated reading method is confirmed almost by every meta-analysis. However, the diversity of the additional instructional components within these repeated reading interventions is evident, raising the need for further discussion.

5. Synopsis and Comments of Meta-analyses Findings

The goal in this paper is to identify the most effective instructional strategies and intervention components for reading fluency development through a review of eight meta-analyses. Eight related to reading fluency meta-analyses, which were published between 2000 and 2015, evaluating 272 related studies (196 out of them focused only on reading fluency), are examined. Our review and processing of the eight meta-analyses follows and uses the "LD Alerts" format. In detail, for this literature study, the "Promising" strategies and intervention components gather support by almost every meta-analysis and they seem to be effective under a variety of conditions and educational contexts and also for the majority of students, regardless of their grade or reading level. On the other hand, "Carefully Used" strategies and intervention components are the ones that are only partially supported by the research, reporting controversial, negative or limited evidence.

5.1 The "Promising" Instructional Strategies and Intervention Components

The "Promising" instructional strategies and intervention components are the most effective ones and they are proposed to be used in reading fluency interventions. These strategies and components concern the factors of intervention administrator, instructional strategies and students' grade and reading level. All the variables are discussed in detail below.

The most commonly studied reading fluency teaching method throughout this meta-analyses review is the repeated reading. Its effectiveness is supported by every meta-analysis, documenting moderate to high effect sizes on reading fluency development both for familiar and unfamiliar texts. Furthermore, repeated readings are effective for students from kindergarten through high school and for students with different reading levels and cognitive skills. Repeated readings document also

significant effect sizes in a variety of contexts and settings, such as gender, type of schooling and teaching conditions (Galuschka et al., 2014; Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012; NICHD, 2000; Suggate, 2014; Therrien, 2004; Yang, 2006).

Another effective instructional strategy, which is proposed as a prerequisite structural component for every reading fluency intervention, is the goal-setting. Goal-setting is usually implemented in combination with self-monitoring and reinforcement (Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012; Therrien, 2004), since their combination is highly effective for all age groups and for students with different reading levels, improving significantly their performance in familiar and to a lower but remarkable degree in unfamiliar texts (Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012; Therrien, 2004). Goal-setting implementation has larger effect when it is administered by an adult (Therrien, 2004), indicating that the guidance by an experienced adult is an irreplaceable part for every instructional intervention. Further, Morgan and his colleagues (2006, 2012) indicated the high long-term effects of the goal-setting strategy on reading fluency. Finally, there is an agreement that three reading repetitions are adequate for significant improvement in reading fluency for familiar texts, while up to four repetitions lead to generalization of the acquired skill to unfamiliar ones (Lee & Yoon Yoon, 2015; Therrien, 2004).

Goal-setting and self-monitoring behaviors appear to be two types of learning skills that boost effectiveness of reading fluency interventions (Ramdass & Zimermman, 2011). According to Joseph και Eveleigh' (2011) meta-analysis, self-monitoring techniques develop significantly the total reading performance, indicating the major role of motivation and goal-setting in reading behavior. However, since goal-setting is used mostly in combination either with self-monitoring or with reinforcement strategies does not permit identification of its specific contribution.

The significant role of adults in intervention administration is confirmed by the previous meta-analyses review, as well. The effect sizes of the reading fluency interventions are much higher when they are administered by an adult (Therrien, 2004) and especially by a researcher or intervener (Suggate, 2014). It seems that researcher administrators are well-trained and know exactly both how to apply each strategy effectively, following the protocol and how to provide appropriate feedback to students according to their individual needs.

An additional point of agreement of this meta-analyses review refers to the type of cueing that should be provided to students before the reading process. Two meta-analyses set relevant research questions and concluded that students who are cued to focus both on speed and comprehension during their reading have better results, developing to a larger extent their reading fluency performance than students who focus only on speed or comprehension, separately (Therrien, 2004; Yang, 2006). The better results of the simultaneous existence of speed and comprehension cues are probably correlated to the strong and reciprocal relationship between reading speed

and comprehension (Berninger et al., 2010· Dowhower, 1989; Hudson, 2011; Stanovich, 1980).

Providing a preview constitutes another "promising" instructional strategy. Data revealed that students' reading fluency is higher when a preview strategy is preceded (Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012). Discussing about the text content in advance or practicing the text key-words before reading them within the text help students to read faster and better. Preview has also small to medium effect sizes on reading fluency for elementary and secondary students with special educational needs (Morgan et al., 2006, 2012). Furthermore, different types of previewing may have different effect sizes. Specifically, listening to the text model reading improves more students' reading fluency than the pre-teaching of text key-words (Lee & Yoon Yoon, 2015). It is possible that listening in advance to the text model reading assists in the construction of semantic expectations based on the text content, triggering students' motivation and involvement, which in turn leads to better reading speed (Chard et al., 2002). However, preview strategy is characterized by difficulties, as well, since it is a broad term, incorporating many strategies and techniques.

In regard to the impact of model reading on reading fluency development, two meta-analyses reported that interventions which incorporate model reading improve students' reading fluency on moderate level (Morgan & Sideridis, 2006; Therrien, 2004). Morgan and Sideridis (2006) reported that reading fluency of familiar texts can be improved through model reading to a lower however degree, compared to other strategies results. Also, it is worth mentioning that its effect is much higher when it is implemented by an adult compared to experienced peer reader or recorded material (Therrien, 2004).

Four out of eight meta-analyses investigated the role of students' grade and reading skills in reading fluency development (Morgan et al., 2012; Suggate, 2014; Therrien, 2004; Yang, 2006). Despite the fact that we do not hold clear evidence about the grade and reading level for which the reading fluency interventions are more effective, some general conclusions can be drawn. The meta-analyses focusing only on first grades students (K-6th grade) (NICHD, 2000; Suggate, 2014; Therrien, 2004; Yang, 2006), concluded that reading fluency interventions have great impact on students from kindergarten through 6th grade for both familiar (Therrien, 2004) and unfamiliar texts (NICHD, 2000; Lee & Yoon Yoon, 2015; Suggate, 2014; Therrien, 2004; Yang, 2006). Furthermore, according to four meta-analyses (NICHD, 2000; Lee & Yoon Yoon, 2015; Morgan & Sideridis, 2006; Morgan et al., 2012), secondary students respond also well to reading fluency interventions. However, the results are different, depending on students' reading skills, with students with or at risk for reading disabilities improving their reading fluency more than typical readers (Morgan et al., 2012; Suggate, 2014; Therrien, 2004; Yang, 2006). Finally, although criteria for identifying students with or at risk for reading difficulties are variable, reading fluency of low readers seems that it can be improved despite its complex and multidimensional structure (Torgesen & Hudson, 2006).

Overall, the review of the eight meta-analyses data reveals several strategies and intervention components, which should be incorporated into every reading fluency intervention. The findings concern important intervention factors, such as instructional strategies, the training of the person administering the intervention, the number of times that students should read the same text and the students' group ages and reading skills. Therefore, what we found is that when we provide more than four times of reading repetitions, when we include goal-setting in combination with self-monitoring and reinforcement, when there is guidance by an adult and the focus is placed both on speed and comprehension during the reading process, and when we use model reading and text preview reading fluency interventions become more effective. Additionally, although reading fluency interventions appear to be effective in all school grades and for students with different reading skills, are more effective with younger students and with students with or at risk for reading difficulties.

5.2 The "Carefully Used" Instructional Strategies and Intervention Components

Based on this meta-analyses review several "Carefully Used" instructional strategies and components are identified. The "Carefully Used" variables concern major intervention factors, such as intervention and session duration and frequency, instructional strategies, the role of gender and type of disability as well as the educational settings and long-term effects. The "Carefully Used" strategies and intervention components are discussed below and classified into three broader groups: (a) intervention strategies and factors with controversial results, (b) intervention strategies and factors with small effect sizes, and (c) intervention strategies and factors with limited support.

The review of the eight meta-analyses raises one strategy and one intervention dimension with controversial results. Regarding the first one, the effectiveness of feedback provision on reading fluency appears to be inconclusive. On the one hand, National Reading Panel (2000) reported that repeated readings are more effective when they are combined with immediate feedback provision regarding students' reading accuracy and expression. On the other hand, Therrien (2004) indicated that for familiar texts, interventions with feedback provision lead to lower results, compared to interventions which do not include this strategy. Discrepancies in these meta-analyses results may be attributed to the different methodologies and test analysis used by the researchers, to their different experimental designs as well as to the different students' characteristics, grades and reading skills.

Duration of intervention is another decisive intervention dimension with controversial results. In two out of eight meta-analyses the role of this intervention dimension was examined, leading however to diverse results (Galuschka et al., 2014; Yang, 2006). Firstly, we need to clarify that in one meta-analysis only five reading fluency studies were included, with results not being significant and concerning only students with reading difficulties (Galuschka et al., 2014). So, according to Yang's meta-analysis (2006), the most appropriate number of weeks are one to six, recording

moderate effect sizes, while Galuschka and his colleagues (2014) concluded that implementation of intervention should last more than twelve weeks. Regarding the total number of hours, results were controversial, as well. Yang (2006) proposed that interventions should last 15 to 30 hours, while Galuschka and his colleagues (2014) recommended more than 35 hours. Therefore, more studies should be conducted in order to get valid results on this decisive intervention dimension.

In second group, two intervention strategies with small effect sizes are included. The effect of sight-word reading instruction on reading fluency was examined in several studies, confirming its small effect sizes on reading fluency development (Morgan & Sideridis, 2006; Morgan et al., 2012; Yang, 2006). The researchers agreed that the implementation of sight-word reading strategies has small effect sizes on text reading fluency cultivation, proving that sight-word reading strategies focus more on decoding skills rather than on reading speed. In the same framework, Morgan and his colleagues (2006, 2012) confirmed that the effect of word level instruction on text reading fluency is significantly lower, compared to other reading fluency instructional strategies, indicating that reading fluency development acquired at word level is not generalized to text one. Regarding peers' involvement in reading fluency intervention there is an agreement on their small effectiveness in reading fluency development. Four meta-analyses confirmed that students' peers may not be the best administrators for reading fluency interventions, recording small effect sizes (Morgan et al., 2012; Suggate, 2014; Therrien, 2004; Yang, 2006). Students' peers may not know exactly how to support appropriately their peers who are in need.

Finally, the third group entails one instructional method and also several intervention dimensions with limited available data. The instructional method concerns the silent independent reading and the intervention dimensions concern the duration and frequency of training sessions, the role of gender and disability, the role of educational settings as well as the long-term effects. The available data for each of them derives either from one or two meta-analyses, raising the need for further investigation. Specifically, the data about the way that silent independent reading is executed and how it is related to oral reading fluency and comprehension is limited and the existing data records very small effect sizes (Yang, 2006). However, there are several methodological issues that hinder the comparative study of silent independent reading and repeated readings. In addition, Morgan and his colleagues (2006, 2012) tried to address several important questions, examining the role of gender and disability and the role of the different educational settings in reading fluency interventions. Specifically, Morgan and his colleagues (2006, 2012) revealed that girls respond better to reading fluency interventions than boys as well as students with visual problems than students with other types of disability. Regarding the role of educational settings in reading fluency instruction, Morgan and Sideridis (2006) reported that general educational settings are more appropriate for reading fluency interventions. There is also available data about interventions held with computer involvement which

reported small effect sizes on reading fluency development, as well (Galuschka et al., 2014; Suggate, 2014).

Similarly, only one meta-analysis (Yang, 2006) examined the important role of session length and frequency in effectiveness of reading fluency interventions. Yang concluded that interventions that last more than 45 minutes per session produce higher effect sizes, while sessions lasting between 15-30 minutes produce smaller. However, it should be mentioned that studies, included in Yang's (2006) meta-analysis and last more than 45 minutes were only four, limiting the validity of these results. Regarding the session frequency, Yang proposed that one to two times per week is the best frequency for the reading fluency instruction, meta-analyzing data again from only four relevant studies. Three to four sessions per week are the second more effective proposed frequency for reading fluency intervention. Finally, according to Yang, interventions which last up to 60 minutes per week totally, are the most effective, documenting a moderate effect sizes.

6. Conclusion

Over the last six decades, it seems that the scientific community has focused its interest on reading fluency development. Specifically, research interest seems to be focused mostly on young students and on students with or at risk for reading difficulties, with their basic research questions concerning the instructional strategies that lead to more substantial reading fluency development. The review of the eight relevant meta-analyses confirms the positive effect of repeated readings on reading fluency development and cultivation, documenting moderate to high effect sizes. Extremely important seems to be the role of adult in interventions administration, since it increases the level of their effectiveness. Furthermore, goal-setting, reinforcement and self-monitoring appear to be the most effective instructional strategies within the repeated reading interventions, revealing the significant role of motivation, self-regulation and goal-focused behavior in reading. In addition, preview and cue provision have a decisive role in reading fluency interventions. Specifically, when students are cued in advance to focus both on reading speed and comprehension during the reading process they improve their reading fluency performance to a greater extent. Finally, at least four reading repetitions of the same text are a prerequisite for every reading fluency intervention.

7. Recommendations

Despite the extensive research on reading fluency instruction, several intervention dimensions remain to be studied. As it has already been stated above, the intervention and session duration and frequency, the teaching methods and strategies, the role of gender and the type of disability as well as the educational settings and the long-term effects are some intervention dimensions for which limited data is available.

Furthermore, the reading material is another basic dimension of reading fluency interventions that influence their effectiveness significantly. The readability level, the linguistic characteristics, the content as well as the genre and the number of the overlapping words constitute some text features that affect reading significantly and their contribution to reading fluency instruction should be examined in depth. In addition, the level of orthographic consistency seems to mediate the effectiveness of the reading fluency interventions to a great extent. Findings from inconsistent orthographies, such as the English one, do not converge with the findings from consistent orthographies, such as the Finnish and Greek. So, a meta-analysis which will focus only on consistent orthographies will be very informative and useful.

About the authors

Susana Padeliadu is a Professor of Special Education at Aristotle University of Thessaloniki, at Faculty of Philosophy and Education. Her research focuses on the field of special education and especially students with specific learning disabilities, including studies on the nature and the assessment of learning disabilities of children in Greek language and the relationship between reading difficulties and other factors, such as psycho-social factors. Further, her interest includes meta-cognitive abilities and strategies. She has also worked on issues related to school and social integration of students with special needs. Finally, significant part of her work focuses on teacher training and the development and evaluation of appropriate teacher-training programmes.

Sophia Giazitzidou is a PhD student in Special Education at Aristotle University of Thessaloniki, at Faculty of Philosophy and Education. Her research interests focus on the field of special education and especially on students with specific learning disabilities. Her main research activity includes studies on reading fluency. Specifically, in her PhD research examines the contribution of the main cognitive and linguistic factors to reading fluency in students with and without learning disabilities. In addition, she has worked on eye-tracking reading experiments and on issues related to school and social integration of students with special needs

References

Adams, M. J. (1990). *Beginning to Read: Thinking and Learning about Print*. Cambridge, MA: The MIT Press.

Berninger, V., Abbott, R., Trivedi, P., Olson, E., Gould, L., Hiramatsu, S., Holsinger, M., McShane, M., Murphy, H., Norton, J., Boyd, A., & York Westhaggen, S. (2010). Applying the Multiple Dimensions of Reading Fluency to Assessment and Instruction. *Journal of Psychoeducational Assessment*, 28(1), 3-18.

Breznitz, Z. (2006). *Fluency in Reading. Synchronization of Processes.* London: Lawrence Erlbaum Associates.

Chard, C., Vaughn, S., & Tyler, B. (2002). A Synthesis of Research on Effective Interventions for Building Fluency with Elementary Students with Learning Disabilities. *Journal of Learning Disabilities*, 35, 386-406.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd eds.)*. Hillsdale, NJ: Lawrence Earlbaum Associates.

Di Filippo, G., & Zoccolotti, P. (2012). Separating Global and Specific Factors in Developmental Dyslexia. *Child Neuropsychology : A Journal on Normal and Abnormal Development in Childhood and Adolescence,* 18(4), 356-91.

Dowhower, S. (1989). Repeated Reading: Research into Practice. *The Reading Teacher,* 42(7), 502-508.

Ehri, L. (1997). Phases of Development in Learning to Read Words by Sight. *Journal of Research in Reading*, 18(2),116-125.

Galuschka, K., Ise, E., Krick, K., & Schulte-Körne, G. (2014). Effectiveness of Treatment Approaches for Children and Adolescents with Reading Disabilities: A Meta-Analysis of Randomized Controlled Trials. *PLoS ONE*, 9(2), e105843. http://doi.org/10.1371/journal.pone.0105843

Hudson, R. (2011). Fluency Problems. In R.E. O'Connor and P.F. Vadasy (Eds.), *Handbook of Reading Interventions* (169-197). NY: The Guilford Press.

Huey, E.B. (1908).*The Psychology and Pedagogy of Reading.* Cambridge, MA: MIT Press.

Joseph, L., & Eveleigh, E. (2011). A Review of the Effects of Self-Monitoring on Reading Performance of Students with Disabilities. *The Journal of Special education,*45(1) 43–53.

Katzir, T., Kim, Y., Wolf, M., O'Brien, B., Kennedy, B., Lovett, M., & Morris, R. (2006). Reading Fluency: The Whole is More than the Parts. *Annals of Dyslexia,* 56(1), 51-82.

Kim, Y., Park, H., & Wagner, R. (2014). Is Oral/Text Reading Fluency a "Bridge" to Reading Comprehension? *Reading and Writing*, 27, 79-99.

Kuhn, M., & Stahl, S. (2003). Fluency: A Review of Developmental and Remedial Practices. *Journal of Educational Psychology,* 95, 3-21.

LaBerge, D., & Samuels, S. (1974). Toward a Theory of Automatic Processing in Reading. *Cognitive Psychology,* 6, 293-323.

Lane, H., & Pullen, P. (2005). Reading Fluency Assessment and Instruction: What, Why, and How? *The Reading Teacher,* 58, 702-714.

Lee, J., & Yoon Yoon, S. (2015). The Effects of Repeated Reading on Reading Fluency for Students with Reading Disabilities: A Meta-Analysis. Journal of Learning Disabilities. 50(2), 213-224.

Lo, Y., Cooke, N. L., & Starling, A. L. (2011). Using a Repeated Reading Program to Improve Generalization of Oral Reading Fluency. *Education and Treatment of Children*, 34(1), 115–140.

Logan, G. D. (1997). Automaticity and Reading: Perspectives from the Instance Theory of Automatization. *Reading and Writing Quarterly, 13*, 123-146.

Martin-Chang, S., & Levy, B. (2005). Fluency Transfer: Differential Gains in Reading Speed and Accuracy Following Isolated Word and Context Training. *Reading and Writing*, 18, 343-376.

McGuinness, D. (2004). *Early Reading Instruction. What Science Really Tells Us about How to Teach Reading*. London: The MIT Press.

Meyer, M., & Felton, R. (1999). Repeated Reading to Enhance Fluency: Old Approaches and New Directions. *Annals of Dyslexia*, 49, 283-306.

Morgan, P., & Sideridis, G. (2006). Contrasting the Effectiveness of Fluency Interventions for Students with or at Risk for Learning Disabilities: A Multilevel Random Coefficient Modeling Meta-analysis. *Learning Disabilities Research & Practice*, 21(4), 191-210.

Morgan, P., Sideridis, G., & Hua, Y. (2012). Initial and Over-Time Effects of Fluency Interventions for Students with or at Risk for Disabilities. *The Journal of Special Education*, 46(2), 94-116.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching Children to Read: An Evidence-based Assessment of the Scientific Research Literature on Reading and its Implications for Reading Instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

Padeliadu, S., & Botsas, G. (2007). *Learning Difficulties. Basic Concepts and Characteristics.* Volos: University of Thessaly University of Pedagogy Department of Special Education.

Perfetti, C. A. (1985). *Reading Ability*. New York: Oxford University Press.

Pullen, P., & Wills Lloyd, J. (2008). Fluency Instruction. *Current Practice Alerts,* 15, 1-4. Retrieved February 1, 2014, from http://teachingld.org/alerts#fluency-instruction

Ramdass, D., & Zimmerman, B. (2011). Developing Self- Regulation Skills: The Important Role of Homework. *Journal of Advanced Academics.* 22(2), 194–218.

Rasinski, T. (2010). *The Fluent Reader (2th ed.)*. U.SA.: Scholastic.

Rasinski, T., Homan, S., & Biggs, M. (2008). Teaching Reading Fluency to Struggling Readers: Method, Materials and Evidence. *Reading and Writing Quarterly,* 1-23.

Samuels, S. (1979). The Method of Repeated Readings. *The Reading Teacher,* 32(4), 403-8.

Schreiber, P. (1991). Understanding Prosody's Role in Reading Acquisition. *Theory into Practice*, (30), 3, 158-164.

Share, D. (2004). Orthographic Learning at a Glance: On the Time Course and Developmental Onset of Self-Teaching. *Experimental Child Psychology*, 87, 267–298.

Stanovich, K. (1980). Toward an Interactive-Compensatory Model of Individuals Differences in the Development of Reading Fluency. *Applied Psycholinguistics*, 9, 315-334.

Suggate, S. (2014). A Meta-Analysis of the Long-Term Effects of Phonemic Awareness, Phonics, Fluency, and Reading Comprehension Interventions. *Journal of Learning Disabilities,* 49(1), 77-96.

Therrien, W. (2004). Fluency and Comprehension Gains as Result of Repeated Reading: A meta-Analysis. *Remedial and Special Education*, 25, 252-261.

Therrien, W., & Kubina, R. (2006). Developing Reading Fluency with Repeated Reading. *Intervention in School and Clinic*, 41, 156-160.

Torgesen, J., & Hudson, R. (2006). Reading Fluency: Critical Issues for Struggling Readers. In S. Samuels & A. Farstrup (Eds.), *Reading Fluency: The Forgotten Dimension of Reading Success*. Newark, DE: International Reading Association.

Vygotsky, L. S. (1997). *Mind and Society*: *The Development of Higher Phycholinguistic Processes*. Athens: Gutenberg.

Wimmer, H. (1993). Characteristics of Developmental Dyslexia in a Regular Writing System. *Applied Psycholinguistics*, 14, 1-33.

Wolf, M., & Katzir-Cohen, T. (2001). Reading Fluency and its Intervention. *Scientific Studies of Reading.* 5, 211–39.

Yang, J. (2006). *A Meta-Analysis of the Effects of Interventions to Increase Reading Fluency Among Elementary School Students*. Tennessee: Graduate School of Vanderbilt University.

Zoccolotti, P., De Luca, M., Di Pace, E., Judica, A., Orlandi, M., & Spinelli, D. (1999). Markers of Developmental Surface Dyslexia in a Language (Italian) with High Grapheme-Phoneme Correspondence. *Applied Psycholinguistics*, 20, 191–216.